hospital is proposed, his confidence in his diagnosis is gone, and he declines to certify under his own hand and seal a fact upon which he has been acting for weeks together. True, it may be replied that his refusal to give the certificate arises not from any doubt of the correctness of his opinion, but from the apprehended difficulty of making others—lawyers and judges, for instance—believe it. He stands in fear of being reproached, if not punished, for certifying a fact on the representations of others, which sends a person into close confinement. We do not ignore the danger, but we cannot see how it exonerates the physician from the performance of his duty. He might, for the same reason, decline any other professional duty involving much difficulty and responsibility, but we are not sure that he would thereby enhance his own reputation. Far better is it to stand by the doctrine, in courts as well as out of courts, that the evidence of others besides the patient is a legitimate foundation for a professional opinion. Let it be considered an established thing that in a conflict between medicine and law on such a point, the latter must go to the wall. Laws may be changed by the will of man; the truths of science, never.

While we have been obliged occasionally to dissent from Dr. Blandford, we would not have it supposed that we thereby abate one jot of the praise we have bestowed on the general merits of the work. So good a book can well bear a little criticism, especially when it reveals neither weakness nor self-conceit, but only an honest, thoughtful difference of opinion. We end as we began, in heartily recommending it as a most useful and reliable guide to the general practitioner.

The synopsis of the laws in the different States of the Union, added in the American edition, will supply a want much felt by the practising physician. In this State, and the same is probably true of other States, a large proportion of the patients are sent to hospitals without regard to the requirements of the law, and consequently the parties are put to additional trouble and expense.

I. R.

ART. XXVII.—*Der Scheintod Neugeborener.* Sendschreiben an Herrn Dr. C. LUDWIG, Professor der Physiologie in Leipzig, von Dr. B. S. SCHULTZE, Professor der Geburtshülfe in Jena. 8vo. pp. 179. Jena, 1871.

Stillborn Infants. An Epistle addressed to Dr. C. LUDWIG, Professor of Physiology in Leipsic, by Dr. B. S. SCHULTZE, of Jena.

IT could scarcely be expected that an octavo volume of one hundred and seventy-nine pages could be profitably occupied by a consideration of the single subject of stillborn infants, without its being eked out by a long series of minutely detailed cases, especially when the small space usually allotted to it in our standard works on midwifery is considered. Yet we must confess that Dr. Schultze's volume is replete with instruction of a strictly practical character. This latter commendation may, perhaps, be thought inapplicable, at least, to the section which treats of the medical history and bibliography of the subject of Dr. S.'s "sendschreiben." Though not in a strict sense directly practical, yet this section is sufficiently interesting, and may even become indirectly practical also, by serving as an index to the experience and conclusions of preceding observers. The chapter on the physiology of the fœtus in utero is particularly full, and forms an appropriate introduction to the inquiry into the several causes by which the healthful play of its several functions may be impaired or destroyed.

The condition of a stillborn infant is, according to Dr. S., in all cases one of asphyxia. A condition resulting from the action upon the infant before birth of certain morbific causes, the asphyxiating action of which continuing after birth without necessarily involving the extinguishment of life. Many objections have been made to referring in all cases stillbirth to a condition of asphyxia, among which stands prominent the fact that the stillborn sometimes present an anæmic, and at others an apoplectic condition. Under both Dr. S. nevertheless insists that the stillbirth is one of actual asphyxia. The mass of blood, in the one instance, is insufficient to enable it to take up and convey an adequate amount of oxygen to the medulla oblongata, the excitability of which is in consequence reduced and finally extinguished. If the diminution in the mass of blood takes place very suddenly, deficient respiration also occurs, as any one may convince himself who watches the effect of a sudden detracting or loss of blood. On the other hand, the apoplectic form of asphyxia is when the medulla oblongata is not in a condition to respond to the normal excitors presented to it, in consequence of which there occurs in the child *in utero*, indirectly, an interruption to the action of the "respiratory function" as well throughout the tissues of the unborn infant, as in the placenta; the blood is thereby rendered deficient in oxygen, and the veins become loaded with undecarbonized blood, which, at birth, becomes an efficient cause of continued or increased apnœa.

We present the following as the author's general statement of the four pathological conditions into one or other of which stillborn children are distributable:—

1. A so greatly diminished excitability of the medulla oblongata, that under the normal excitants the proper nervous influence from it is no longer transmitted to the respiratory apparatus, hence there necessarily results a deficient supply of oxygen to the blood.

2. A deficient oxygenation of the blood, and its necessary concomitant, an abnormal accumulation of carbon in the blood. Circumstances which continue in close relationship, so long as the circulation and respiration remain suspended.

3. Constant lessening in the force of the circulation from the slowness of the heart's contractions, and the immediate and secondary consequences, causing what may in some sense be considered as a compensatory movement, besides overfilling of the heart with blood, directing the flow of the latter towards the thorax.

4. The clogging up, to a greater or less extent, of the trachea with liquor amnii, meconium, slime, and blood.

1. To arouse the suspended vitality of the stillborn who fall within the *first* proposition, in other words, to overcome the defective excitability of the medulla oblongata, presents, according to our author, three indications: either to increase the excitation of the medulla, so that the respiratory nerves shall react; to endeavour, by acting upon the peripheral nerves, to excite the action of the respiratory muscles; or finally, to endeavour to reinstate the normal excitability of the medulla. By a reflex action produced by an excitement applied to the surface, it is often possible to procure the desired effect. As by sprinkling cold water upon the infant's face, upon the neck, or the præcordial region; rubbing the surface of the latter parts with snow; the application of ether to the præcordia; slapping the buttocks or back with the hand; or slight blows with a leafy twig upon the skin; injections of cold water per anum; allowing the fumes of ammonia to pass into the nostrils, etc. The most certain of the means for exciting the action of the respiratory muscles is, perhaps, the sudden momentary immersion of the infant up to its shoulders in a pail of cold water. In very desperate cases, it has been recommended to arouse the latent excitability of the diaphragm by an electric current directed in the course of the phrenic nerve. It does not seem, however, to receive the hearty commendation of Dr. S.

It must be evident that the most rational method of rousing to activity the inert functions of the several vital organs is only to be attained by securing a prompt and active renewal of the respiratory function, and a consequently regular and adequate supply to them of arterial blood.

2. In the cases of stillborn embraced by the *second* proposition, there is a deficiency of oxygen. Now, after birth, this deficiency can be supplied only through the lungs; and hence, in the absence of natural respiration, an attempt must be made to imitate it artificially. Besides the direct excitation of the respiratory movements, by an electric current directed upon the phrenic nerve, the lungs may be inflated by forcing air into them through the mouth or nose of the infant, by means of the mouth of the obstetrician himself, or through a catheter, by means of a syringe; and at the same time so manipulating the body

of the infant as to cause, as far as possible, expansion and contraction of the chest; premising the effort at inflation, by clearing the trachea with a syringe through an elastic tube, of whatever fluids it may contain. The objections to the inflation of the lungs of stillborn children are fairly stated by the author. When, however, the operation is skilfully and cautiously performed, and the filling and emptying of the air-cells of the lungs is promoted by the proper handling of the infant's body, we have found it, in the general run of cases, the most efficient means of removing the asphyxia, and permanently re-establishing the suspended respiration. When persevered in sufficiently long, in our hands it has seldom failed.

3. In reference to the cases of stillbirth embraced by the *third* proposition. It may be understood that when the infant is born deeply asphyxiated, with very slight action of the heart, while the blood in the capillaries of the lungs is almost stagnant, how little of the circulating mass can by artificial inflation of the lungs be brought in contact with oxygen. Hence, the increased action of the heart caused by such means is only of temporary continuance. Artificial respiration can only be productive of permanent results when, at the same time, there occurs, as well through the vessels of the lungs as throughout the entire ramifications of the aorta, a life-supporting circulation of blood. But while the immediate result of artificial respiration may be only circumscribed and temporary, nevertheless the artificially excited action of the respiratory organs may become ultimately the cause of the reinstatement of the excitability of the nervous centres, and thus be the means of recalling the normal activity of the respiratory muscles. When, as in cases where the stillborn child is so intensely asphyxiated that the action of the heart is suspended to such an extent that its influence upon the difference in the flow of blood through the venous and arterial systems of vessels is such that a resulting cessation of the entire course of the blood would seem to be at hand, the only hope of saving the infant is in the possibility of a renewal of the excitability of the medulla oblongata, and the consequent supply of the requisite amount of oxygen to the blood, by increasing the force and activity of the circulation and in equalizing the difference in the tension of the blood in the arteries and veins. When there exists a constantly increasing deficiency of oxygen, it is by an increase in the excitability of the centres of the motor nerves of the heart that we are to seek the means for bringing about the desired result, and accomplishing a change in its proper activity in respect to the intra-thoracic pressure.

Already by each quiet expiration, still more through each increase in the fulness of expiration, the pressure upon the arterial blood throughout the body becomes evidently increased, partly by reason of the contraction of the heart following the succeeding contraction, as the division of the vagus nerves shows, and partly by the action of the thoracic pressure upon the column of blood. When, as may be the case, the asphyxia in new-born children is very intense, the first factor in great measure failing from the defective excitability of the centre of the motor nerves of the heart, it is essential that the second factor be brought as quickly as possible into activity. The influence of the respiratory deficiency upon the tension of the blood in the arterial system is in an inverse condition to that in the venous. From the simple fact of the persistence of the fœtal valvular arrangement of the heart, it becomes clear, *a priori*, as is the fact proved, also, from observation, that every increase of tension exerted upon the column of blood in the aorta causes a diminution of pressure in the contents of the jugular veins, while a diminution in the arterial pressure is followed by an increase in the veins of the trunk. The difference in the pressure upon, as well, the blood in the arterial system and its ramifications over the entire body, as in the entire venous system, results from a simple expiration from and an inspiration of air into the lungs, and is increased by the simple systole and diastole of the heart. The ordinary deficiency in pressure upon the blood in the jugulars produced by ordinary inspiration is doubly compensated by the systole of the heart, while by deeper inspiration the deficiency is rendered fourfold. Now, there is no way in which an already existing difference in the circulation through arterial and venous trunks can be rectified, so long as the valve arrangement of the fœtal heart persists, even in the new-born infant, excepting by acting upon the capillaries, and by accelerating thus the movement of the entire circulation.

This, it is supposed, may be effected by first inflating the lungs, and then causing expiration by an intermittent compression of the thorax. Dr. S. passes in rapid review the leading plans suggested for the attainment of artificial respiration, most if not all of which he finds to be not calculated to effect well or entirely the end proposed. He notices Dr. Marshall Hall's plan for the recovery of the apparently dead from drowning, and thinks it may be advantageously resorted to in the lighter cases of asphyxia in the stillborn.

For more than twelve years, Dr. S. assures his friend in Leipsic, he has followed a process of artificial respiration in cases of profoundly asphyxiated new-born children, of which he speaks in the highest terms of commendation. When timely and perseveringly put in practice, according to his experience, it seldom fails to procure perfect resuscitation, even in cases where a prompt resort has been had to artificial inflation of the lungs, which, after much loss of time, has failed of the desired result. The plan of the author is, as he states, calculated to cause at one and the same time a movement of the ribs and diaphragm, so as to bring about, as far as possible by artificial means, a regular alternate expansion and contraction of the thoracic cavity. The process alluded to is thus described: The infant is to be taken by the shoulders, in such manner that the operator's two thumbs shall lie upon the anterior wall of the thorax, while from behind the index fingers are inserted in the infant's axillæ, while the three other fingers of each hand are passed over the posterior wall of the thorax; the head of the infant resting in the hollow of the hand, supported on each side by the edge of the ulna. The operator, his lower extremities somewhat separated, places the stillborn infant, thus held, near the floor, its arms extending upwards, somewhat in advance of him, he, at the same time, stooping of course slightly forward; without delay he now swings upwards with arms extended the infant, until it rises to a position that brings the arms of the operator very nearly to or rather above a horizontal position; holding it gently but securely, without allowing its body to incline too far forwards, he now gradually turns it over, the weight of its pelvis being thus brought to press upon the abdomen, care being taken that in grasping the infant no compression is made upon the thorax. Its entire support should be by the fingers of the operator inserted in the axillæ. In the upward toss of the infant's body, it must be evident that the necessary curvature of the spine can in no degree encroach upon the thorax, it being almost exclusively confined to the lumbar vertebræ. The thumbs, without exerting pressure upon the ribs, constitute the axes, as it were, upon which the infant turns to commence its slow descent.

The swing of the infant's body into the horizontal position is produced by a movement of the operator at the shoulder-joint; the upward movement of his arm becomes now slower, and is performed by a carefully measured movement of the elbow-joint with a regulated movement of the shoulder-blade upon the trunk. By the thus effected downward movement, the pressure of the infant pelvis as it passes over the abdomen is brought to bear upon the organs of the thorax as well from the upward forced diaphragm as from the compression throughout the entire extent of the thoracic parietes. As a result of this passive expiratory movement, there is often forced out a copious flow of fluid from the larynx and trachea. When the body of the child has been brought down completely to the position into which it was first placed, the operator puts it upon the stretch by bringing it with a brisk upward and backward movement into the space formed by the separation of his legs. The thorax being free from all pressure, the thumbs of the operator lying loose upon the infant's breast, becomes by its own elasticity dilated—provided the entire weight of the infant is allowed to hang entirely upon the index fingers of the operator, so as to allow, by the fixation of their sternal extremities, the ribs entire freedom of action. Thus is brought about, artificially, a very full inspiration. The upheaving movement is again, at the end of a few moments, to be renewed, followed by the slow descent, with the thumb of the operator now firmly pressed upon the anterior parietes of the child's chest. Again occurs mechanical expiration, accompanied, perhaps, by a more copious discharge of fluids from the mouth and nose, and frequently of meconium per anum.

The preceding manipulations are to be repeated for some eight to ten times. Soon the air will be distinctly heard passing through the glottis. If with the expiration, as it constantly augments in force, fluids still continue to be passed from the mouth and nose, the process as above must be persevered in, and until free spontaneous respiration becomes fully and permanently established; which result may be rendered more certain by plunging the infant's body into a warm bath.

By the above description of the plan of Dr. S. for the production of artificial respiration in the stillborn infant there are fulfilled, it will be perceived, three of the required indications for the accomplishment of resuscitation, as certainly as could be expected It rapidly equalizes the difference between the tension in the arterial and venous streams of blood, and thereby brings the circulation into its life-supporting condition; while, at the same time, it brings about a regular change of atmosphere in contact with the air-cells of the lungs, satisfying thus the second indication; while by thus accomplishing the arterialization of the blood, the first indication is fully carried out, and finally the excitability of the medulla oblongata is restored, when this is possible, as rapidly as may be.

4. Cases of stillbirth embraced by the *fourth* proposition are those in which the impediment to the setting in of respiration consists simply in the air-passages having become clogged before birth, with mucosites, etc. The resuscitation in such cases is to be effected by the removal of this impediment, which may be done by a sucking effort of the operator's mouth applied directly to the mouth of the infant, or through an elastic catheter passed into the larynx, or by a syringe and elastic tube. Dr. S. discusses very fully the question of catheterizing the trachea in these cases. From the well-founded objections that may be brought to bear against it, he would prefer in nearly all cases a resort at once to his method of effecting artificial respiration, which he believes will always promptly succeed.

We have thus endeavoured to give a brief sketch of the more practical portion of the volume before us, but one we trust sufficiently full to communicate to our readers a clear idea of the author's teachings. D. F. C.

ART. XXVIII.—*A Cyclopædia of Quantitative Chemical Analysis.* By FRANK H. STORER, A. M., Professor of General and Analytical Chemistry in the Massachusetts Institute of Technology. Part I. pp. 112, and Appendix. Boston: Sever, Francis & Co.

PROF. STORER is already well known to chemists by his *Dictionary of Solubilities*, a work which may be cited as a model of what such a dictionary ought to be, and which the working chemist needs to have always within reach. After publishing some other less important but useful text-books, Prof. Storer has again undertaken a comprehensive and laborious work, the object of which is to enable the analyst, at a glance, to take in all the methods that have been proposed for attaining whatever special end he may happen to have in view. He remarks in his preface:—

"The object of the author in compiling this book has been not only to provide the student and working chemist with a comprehensive dictionary of quantitative processes, but to call the attention of the chemical fraternity to the question of the possibility of presenting this branch of chemical art in a more serviceable and manageable form than has been customary hitherto. The experiment is certainly worth trying, whether a definite system of classifying substances in alphabetical order, and of referring each and every process to the fundamental fact or *principle* upon which it depends, will not greatly facilitate both the study and practice of analysis."

The author correctly judges that the aim of recent publications has been too